

THE ROCK PTARMIGAN IN SOUTHERN BAFFIN ISLAND

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IN his discussion of the local distribution of land birds along the south coast of Baffin Island, Soper (1940:15) names the Rock Ptarmigan (*Lagopus mutus*) among the "common residents" of grass-tundra districts "interspersed with rocky ridges." He includes the Snow Bunting (*Plectrophenax nivalis*), Water-Pipit (*Anthus spinoletta*) and Horned Lark (*Eremophila alpestris*) in the same category, and says of the four species: "They are invariably associated with granitic areas and are therefore absent in the wide, swampy tundras, except for sporadic companies during migration. Where isolated granite ridges protrude from these plains . . . a few pairs will be found nesting." In a more recent paper (1946:225), this author calls *Lagopus mutus* "one of the most characteristic land birds of southern Baffin Island."

In the summer of 1953 we found the Rock Ptarmigan decidedly rare about the head of Frobisher Bay, Baffin Island. Our headquarters were at Lat. 63° 45' N., Long. 68° 33' W., at a Royal Canadian Air Force Base. We covered an area of 18 square miles near the Base by foot fairly regularly. Much of this area was "desert tundra," and birdlife was scarce. A very few pairs of Rock Ptarmigan nested there. At the mouth of the Jordan River, 16 miles west of the Base, we failed to see a Rock Ptarmigan on either of our two visits (July 13; July 17-20). Most of our time there we spent in meadow tundra near the river, not in the rough country farther west. We did not see the bird on Hill Island, Bishop Island, or any of several other islands at the head of the Bay. At Lat. 68° 31' N., Long. 71° 22' W., near a large lake about 50 miles east-northeast of Wordie Bay, we did not see the species on August 8. At Lat. 65° 20' N., Long. 77° 10' W., near Cape Dorchester, we saw both adults and young on August 11 and collected two adult males that day. At Lat. 63° 38' N., 70° 28' W., along the southeast shore of Lake Amadjuak, we saw no Rock Ptarmigan on August 8 but saw literally hundreds of them on August 15. Some sort of migration must have been taking place, although we witnessed no such migration anywhere about the head of Frobisher Bay.

From June 15 to 22 we looked in vain for a ptarmigan in the vicinity of the Base. Daily we came upon evidence that the birds had inhabited the region — recently molted white body feathers; parts of carcasses, principally wings, with white primaries still attached; and droppings. A wing found June 15 looked as if the flesh had been picked from the bones only a week or so before.

On June 21, civilian workmen told us that for some time they had been seeing a pair of "partridges" in high, rough country near a construction

road a mile or so north of the Base. Describing the cock as white, the hen as grey, they said that "just recently" they had not been seeing the hen, so had assumed that she was on her nest. The cock they had been seeing daily.

Early the following morning we found a white male ptarmigan, almost certainly this very bird. He was standing motionless on a huge rock. He gave a low cackle, otherwise we might never have seen him. Despite his being in almost complete winter plumage he was anything but conspicuous, for his white feathers were badly soiled, probably by dust from the much-used road. The red combs above his eyes were scarcely visible, but dark summer feathers spotted his head and upper neck. This was the latest date on which we saw a male ptarmigan largely in winter feather. Soper (1928:105) informs us that in the Nettilling Lake area in 1925 "male birds remained white until well into July." At the head of Clyde Inlet in 1950, Wynne-Edwards (1952:366) saw a male with "dark feathers only on the crown and nape, and a spot on the breast" as late as June 23. In the Kotzebue Sound area of Alaska, on May 28, 1899, Grinnell (1900:36) collected males "in entire winter plumage" except for a few new dark feathers hidden among the old white crown feathers. Along the base of Wales Mountain, in northwestern Alaska, on June 5, 1921, Bailey (1926:123) took a courting male which was "entirely white except for the black loreal patch." Delay of the male bird's molt into summer feather is described in detail by Salomonsen (1939).

We never saw this male ptarmigan again. We later found a female and her brood in this same area, but no male was with them. Salomonsen (1939:417-418) says that in "the latter part of the brooding-time the male will retire to the higher parts of the mountain, where it lives alone the entire summer. The female . . . takes care of the newly hatched young, but when the juveniles are medium-sized it will fly with them higher up the slopes, joining the male, and from now on the . . . family will stick together." Jourdain (in Witherby, *et al.*, 1948:230) says that where ptarmigan are "plentiful, males generally desert broods and join in packs."

On July 6, in high country six or seven miles northeast of the Base, we happened upon a mother ptarmigan and her recently hatched brood. Having found the nest of a Snowy Owl (*Nyctea scandiaca*) along a little stream, we were crossing a rocky ridge. The day had lost its sun and hard snow was falling. The owls had been hooting and diving at us so fiercely that we had been forced to pay attention to them. Now that we were no longer being attacked, we were experiencing the rare sensation of being in owl habitat without either seeing or hearing owls. Suddenly, as we stepped down out of the wind into a sort of gully, we heard a rattling *grrr* or *krrr*

and there, about 15 feet away, was a female ptarmigan running rapidly off with head held low. Standing still while the ptarmigan scurried about, we heard cheeping and saw several chicks scrambling clumsily through the tough strands of heather (*Cassiope tetragona*). We counted nine chicks and set about catching them. Soon we had five, one of which we lifted from water; then a sixth, which had dropped into a foot-deep crevice; finally a seventh, which had crouched among coarse lichens on a rock. The chicks we failed to find must have cheeped from somewhere behind us, for the mother bird ran a few steps in that direction, flew swiftly upslope, alighted, then fluttered back in response to the outcry of the chicks we had captured. Salomonsen (1950:174) discusses at some length "injury feigning" of the mother ptarmigan while the chicks are small, and "distraction by running" after the chicks have begun to fly. What we have just reported clearly shows that running may at times be the "diversionary display" of a hen with very small chicks, and we regard as somewhat finespun and over-complex Salomonsen's statement that the "change . . . from injury-feigning to distraction by running is correlated with physiological alterations, viz. an activation of the feather-growth, the achievement of the autumn-plumage now starting, i.e., a fortnight later than in the male."

The chicks were in the creel we used for carrying specimens. We put them on the ground and covered them with our hands, thus quieting them. The agitated mother came closer. Her crest was lifted, but her body plumage was pressed down tightly so she had a slender, long-necked appearance. She gave two callnotes—the throaty *krrr* just referred to, and a clucking *kit* or *krit*, which made the chicks restless. Wanting to take photographs, we decided on a procedure. One of us was to cover the chicks with his hands until the camera was ready; then, when the female came close and called *krit*, the chicks were to be freed. We did not let all the chicks go at once. When two of them ran to their mother she stood perfectly still, lifted her plumage, and became broody. One by one the rest of the chicks pushed their way under her, and we took photographs at a distance of two or three feet (Fig. 1).

The mother ptarmigan was in virtually complete summer feather. Her wings were largely white, of course, and there were many pure white feathers on her belly and lower breast. Whether these white belly feathers were of the outgoing winter plumage or part of the summer plumage we could not be sure. From the appearance of midsummer adult Rock Ptarmigan specimens we have handled, and from certain illustrations in Salomonsen (1939), we are led to suspect that some white belly feathers are replaced, season after season, in both males and females, with *white* feathers—in other words that the lower belly stays white the year round, just as the remiges do.

We looked in vain for the male bird. Wondering why this particular spot had attracted the ptarmigan, we noticed that no owls were in sight and wondered if we were in an area removed from, or between, the nest-territories and hunting-grounds of the owls. Many owls lived in the vicinity. That these birds were subsisting chiefly on lemmings was becoming more evident to us with every visit we made to their nests. Was this "ptarmigan area" uninhabited by lemmings and therefore unattractive to the owls?



FIG. 1. Female Rock Ptarmigan brooding chicks. Photographed near head of Fro-bisher Bay, Baffin Island, July 6, 1953.

We did not kill that mother bird, but we collected the largest and smallest of the chicks (GMS 11741-42). These proved to be, respectively, a male and a female. Their crops and gizzards were well filled with tiny green leaves of crowberry (*Empetrum*) and bits of sand.

The brood could not have been more than a few hours old. So little developed were the incoming primaries that we had to part the natal down of the manus to find them at all. Jourdain (in Witherby, *et al.*, 1948:230) states that in the Scottish Rock Ptarmigan (*Lagopus mutus millaisi*) the eggs are laid "at intervals of 24 to 28 hours," and the incubation period is 24-26

days; so egg-laying in this case probably started not later than June 3 or 4. On that date there must have been much snow in the high country. Soper (1946:225) found fresh eggs as late as June 28 in the Bowman Bay area in 1929.

On July 8 men at the Base told us of having seen that day a mother ptarmigan and several small young not far from the spot at which we had seen the solitary male July 6. On July 11 we learned that this (or another) hen and her chicks had just been seen in the same place, but we failed to find them. These chicks and the July 6 brood must all have hatched at about the same time. The two areas were about four miles apart.

On July 21, Derry V. Ellis reported that he had just seen a male, female, and at least four young ptarmigan in rough country about two miles east of the Base — between the Hudson's Bay Company post and Tarr Inlet, and not far from the sea. The chicks, about one-third grown, could fly well. Salomonsen (1950:174), discussing the "return of the male" to the female and brood in Greenland, reports "both parents in the covey as early as 28 July . . ." and "hens and chickens without the male" as late as August 25. We have no way of knowing, of course, whether the male seen by Ellis had left the female and brood at all.

On July 22, guided by Ellis, we found this family group about a quarter of a mile from the spot at which Ellis had last seen them. There were five young. The male flew upslope rapidly, alighting a few rods from us. The female beat her ragged wings briefly and noisily, as if trying to fly, but after rising a short distance dropped back to the ground. The young birds all flew well. We collected the adult male and female (GMS 11782-83) and three of the young, one male and two females (GMS 11784, -85, -86). The parent birds were largely white on the belly and lower breast. The male weighed 1 lb., 1 oz., the female, 14 oz. The testes of the male each measured about 3×5 mm. The female had a large, but ill-defined, brood-patch. The crop and gizzard of each of the five specimens was crammed with leaves, stems, buds, green berries, and gravel.

The young birds were still partly in natal down. The white of their incoming remiges was not yet noticeable. From Bent's statement (1932:207) one might expect to find two white outer primaries in chicks at this stage. Actually, as Salomonsen (1939:50) carefully explains, the two white outermost primaries "commence to grow much later than" the other juvenal remiges; they do not reach full length until most or all of the brown juvenal primaries have dropped out; and they may not be part of the juvenal plumage at all. In the three young birds collected by us July 4, the *functional* outermost primaries were dark and brown, but the actual outermost two, mere tips and utterly non-functional, were barely visible. These

incoming feathers were white, but there was dusky mottling along the midrib. In each chick one or more proximal primaries, or distal secondaries, or both, were pure white. These were, though very short, visible when the wing was fully spread.

We had no way of knowing, of course, where these ptarmigan had nested, but the area in which we found them was far removed from our other two "ptarmigan areas": it was, furthermore, the only area in which we found the Short-tailed Weasel (*Mustela erminea*), the only area in which we actually saw the Arctic Hare (*Lepus arcticus*), and one of the very few areas visited by us in which we never saw a Snowy Owl.

On July 22, Derry Ellis saw another "dark" adult ptarmigan, probably a male, on a bluff headland just west of Tarr Inlet. This bird we looked for but did not find.

On July 26 we found a female ptarmigan and six half-grown chicks in high country north of the Base. These birds were feeding contentedly on the lee side of a rocky hill not far above a big lake. The mother bird stood on a rock not far away—motionless until we drew close, whereupon she walked a few steps, flicking her tail excitedly. The brood kept together, moving slowly in the same general direction and pulling the greenery off with rapid jerks of their heads. They were somewhat older than the chicks we had seen on July 22, a fact apparent from their size as well as from the noticeable amount of white showing in their wings as they took flight. Every chick had this white wing-spot. The functional outer primaries were dark, the wing-spot being composed of inner primaries (and outer secondaries?). The mother bird, though in full summer feather, was white-bellied. Her rump was not, so far as we could tell, a mixture of coarsely- and finely-marked feathers, so she probably had not yet started to don "fall" plumage. Her wings were ragged with molt, but she flew fairly well.

On July 28, on a talus slope just above the raised beach paralleling the shore of Tarr Inlet, Parmelee flushed a pair of ptarmigan at about 20 feet. He followed and collected the male (GMS 11793), a handsome gray individual, white on the belly, throughout most of the wings, and in the middle of the throat. The combs above the eyes, though not large, were bright red. The testes each measured about 3.5×5 mm. The crop and gizzard were packed with broken-up leaves, twigs, and buds of willow (*Salix* sp.) and birch (*Betula* sp.).

On August 3, while climbing a steep, boulder-strewn slope just east of Tarr Inlet, we noticed among the unusually luxuriant birch and willow a great deal of ptarmigan sign—fresh droppings, scattered white feathers, nipped-off twigs, and, finally, a few buff-and-black summer feathers. We looked hard for the birds but failed to find them. That afternoon Sutton

returned, investigated the windless places, and found a group of four birds, an adult female and three young, all very tame. Motionless for a time, they came suddenly to life, lifted their heads, pressed their body plumage close, and flicked their tails, as if about to fly, but presently they returned to "normal" and walked slowly to one side. The chicks were almost as large as the adult.

Sutton collected the adult female (GMS 11802) and the largest chick (GMS 11803), a male. Both were molting, the chick extensively. The chick's combs were a brighter shade of red than the adult's, and its two outermost primaries, white except for dusky mottling along the rachis near the tip, were still sheathed at the base. The primary next to these two was brown, and this was the only dark primary left (see Figure 2). The incoming plumage on the sides was pure white; but the body plumage is general was much mottled and barred. The testes measured about 2×3 mm. The crop and gizzard in both specimens were packed with willow leaves and other vegetation.

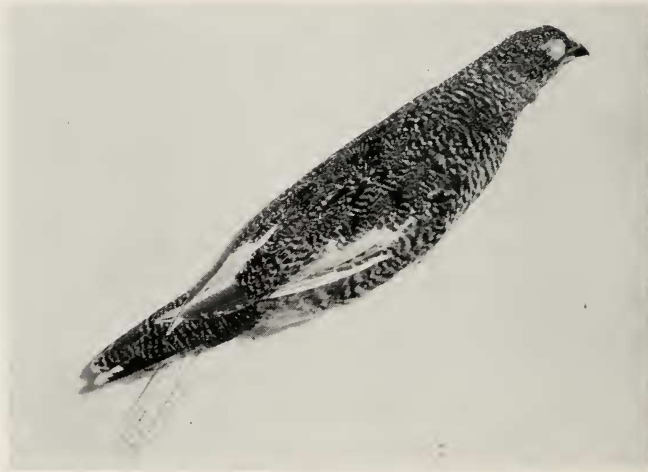


FIG. 2. Young male Rock Ptarmigan collected near head of Frobisher Bay, Baffin Island, August 3, 1953 (GMS 11803). Note the one unmolted brown juvenal primary among the white first-winter primaries.

On August 10 workmen saw a female ptarmigan and nine large young in high country about a mile north of the Base. This could hardly have been the brood seen by us on July 26. We tried to find the birds, but failed. We did not see a ptarmigan anywhere about the head of Frobisher Bay after August 3.

On August 11 we saw several Rock Ptarmigan in the vicinity of Cape Dorchester, near the northwest tip of Foxe Peninsula, an area in which we

had fully expected to find the Willow Ptarmigan (*Lagopus lagopus*) if we found any ptarmigan at all. The country there was much flatter than that about the Base; but just east of the lake-dotted meadow tundra rose several parallel rocky ridges, all low, all extending from the coast to as far southward and inland as the eye could see. Near them, but definitely away from them, out in the grassland, we found several Rock Ptarmigan—first a female and five quarter-grown young; then two adult males feeding together fully three hundred yards from the nearest rocks; then two more adult males. We collected an adult male (GMS 11828) among the rocks and another adult male (GMS 11829) on the tundra. The former we almost certainly would never have seen had it not given a dry, rattling, belch-like cry. The two specimens were very gray, but in both of them the white feathers of the belly, tibiae, tarsi and toes were largely of the *incoming* winter plumage, so the darkest stage of the fall or late summer plumage must surely have passed. The undertail coverts were very dark. These birds were not very fat. Their testes each measured about 3×5 mm.

Along the southeast shore of Lake Amadjuak, on August 15, again in country throughout which we expected to find Willow Ptarmigan, we came upon great flocks of Rock Ptarmigan—most of the birds undersized and young, all in mixed, piebald plumage. They were feeding on the rough, rocky slopes rather than in the grasslands. Not a bird did we see along the lakeshore proper or in a marshy place near a tundra pond. In one flock were several one-third grown young with their solicitous mother, whose cries were unlike those of the other adult birds. In one area fairly swarming with ptarmigan the rattling or cackling was an almost continuous sound. The wind was high and the birds were restless. More than once, in the lee of a hill, we flushed a hundred or so birds at a time and the air was filled with the flashing of white wings. In this country there were many Barren Ground Caribou (*Rangifer arcticus*). We were amused when several of these fine animals, having put the ptarmigan to flight by suddenly breaking into a run, themselves were startled by the whirring and flashing of wings beneath their feet.

We collected an adult male ptarmigan (GMS 11839) which seemed to keep separate from the flocks. This bird was gray, but throughout its body plumage were scattered new white feathers. The testes each measured about 3×5 mm.

NESTING SUCCESS

We saw, or heard of, the following broods: 9 small chicks (July 6), "several" small chicks (July 8), 5 third-grown chicks (July 22), 6 half-grown chicks (July 26), 3 almost full-grown chicks (August 3), 9 "large" chicks (August 10), 5 quarter-grown chicks (August 11), and "several"

third-grown chicks (August 15). The last two broods must have been unusually late in hatching. One pair of adults, seen July 23, were without chicks. The big flocks seen by us August 15 were composed largely of well-developed young birds which seemed to be free of "family ties."

We found no evidence that Snowy Owls nesting near the Base were feeding on ptarmigan. We visited several owl nests quite regularly, carefully examining them and their surroundings at each visit.

Factors favoring the ptarmigan in the vicinity of the Base were (1) absence of the Arctic Fox (*Alopex lagopus*); (2) great rarity of weasels; (3) abundance of lemmings (*Dicrostonyx groenlandicus* and *Lemmus trimucronatus*), the sole prey of the Snowy Owl and Rough-legged Hawk (*Buteo lagopus*), so far as we could ascertain, and an important food-item of the Peregrine (*Falco peregrinus*); (4) absence of jaegers (*Stercorarius* spp.); (5) rarity of the Glaucous Gull (*Larus hyperboreus*) and Herring Gull (*L. argentatus*); (6) an artificial food supply for the Raven (*Corvus corax*) at the Base's dump.

The personnel at the Base did little, if any, gunning. The Eskimos occasionally shot a ptarmigan, we were told, but they did not shoot any during our stay.

DISCUSSION OF SPECIMENS

Our five adult male specimens do not, when lined up in order of capture, show gradual change from "early summer" to "late summer" plumage (Fig. 3). The earliest (July 22) is certainly the most coarsely marked above, especially on the crown, neck, rump and upper tail coverts, but the general appearance of the back is not dissimilar to that of the latest (August 15). The under parts of these two specimens are similar, too, though the white of the July specimen seems to be composed wholly of outgoing feathers, while in the August specimen all these white feathers are new. In only one specimen of the five (July 28) is the middle of the throat noticeably white. In no specimen is the lower belly anything but white. The under tail coverts, throughout the series, are very dark.

Of the two adult females, the earlier (July 22) is decidedly the more boldly marked above, and the under parts of this bird have a blotchy appearance resulting from the presence of numerous unmolted winter feathers. In the August specimen many of the back and rump feathers, scapulars, and upper tail coverts are of the finely vermiculated "late summer" plumage, and the under parts, save for the white of the very middle of the lower belly, are boldly maculate.

The almost full-grown male (August 3) is decidedly like the adult female taken the same day in some respects, an interesting point of similarity being the dusky mottling along the midrib near the tip of the longest primary

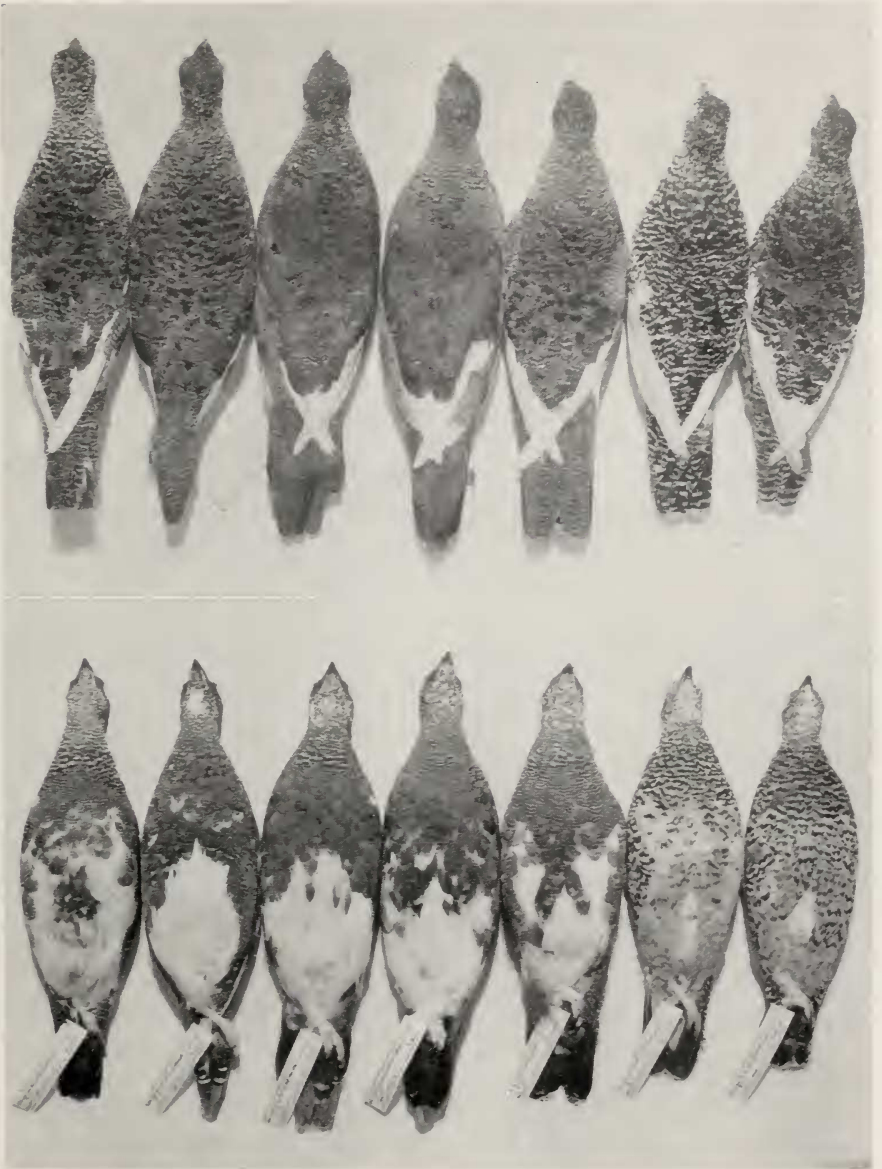


FIG. 3. Dorsal (above) and ventral views of five adult male (left) and two adult female Rock Ptarmigan specimens from southern Baffin Island, arranged in order of capture. Males, left to right: GMS Nos. 11782 (July 22), 11793 (July 28), 11828 (Aug. 11), 11829 (Aug. 11), 11839 (Aug. 15). Females, left to right: GMS Nos. 11783 (July 22), 11802 (Aug. 3).

(see Figure 2). Worth mentioning is the possibility that these primaries are equal or correspondent—that in the female having been held over from the preceding fall, and showing her to be a one-year-old bird, that in the young male being one of its two very first outermost primaries. The outermost primaries of adults more than a year old probably are without this dusky mottling.

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LITERATURE CITED

BAILEY, A. M.

- 1926 A report on the birds of northwestern Alaska and regions adjacent to Bering Strait. Part 9. *Condor*, 28:121-126.

BENT, A. C.

- 1932 Life histories of North American gallinaceous birds. *U. S. Nat. Mus. Bull.* 162:1-490.

GRINNELL, J.

- 1900 Birds of the Kotzebue Sound region, Alaska. *Pac. Coast Avif.* no. 1:1-80.

SALOMONSEN, F.

- 1939 Moults and sequence of plumages in the rock ptarmigan (*Lagopus mutus* [Montin]). *Vidensk. Medd. Dansk Naturhist. Foren.*, 103:1-491.

- 1950-51 The birds of Greenland. (Copenhagen.) Pt. 1: 5-158 (1950); pt. 2: 159-348 (1951); pt. 3: 349-608 (1951).

SOPER, J. D.

- 1928 A faunal investigation of southern Baffin Island. *Bull. Nat. Mus. Canada*, 53:76-116 (Birds).

- 1940 Local distribution of eastern Canadian arctic birds. *Auk*, 57:13-21.

- 1946 Ornithological results of the Baffin Island expeditions of 1928-1929 and 1930-1931, together with more recent records. *Auk*, 63:1-24, 223-239, 418-427.

WITHERBY, H. F., F. C. R. JOURDAIN, N. F. TICEHURST AND B. W. TUCKER

- 1948 The handbook of British birds. Fifth impression. Vol. 5:1-381.

WYNNE-EDWARDS, V. C.

- 1952 Zoology of the Baird expedition. (1950). I. The birds observed in central and south-east Baffin Island. *Auk*, 69:353-391.

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